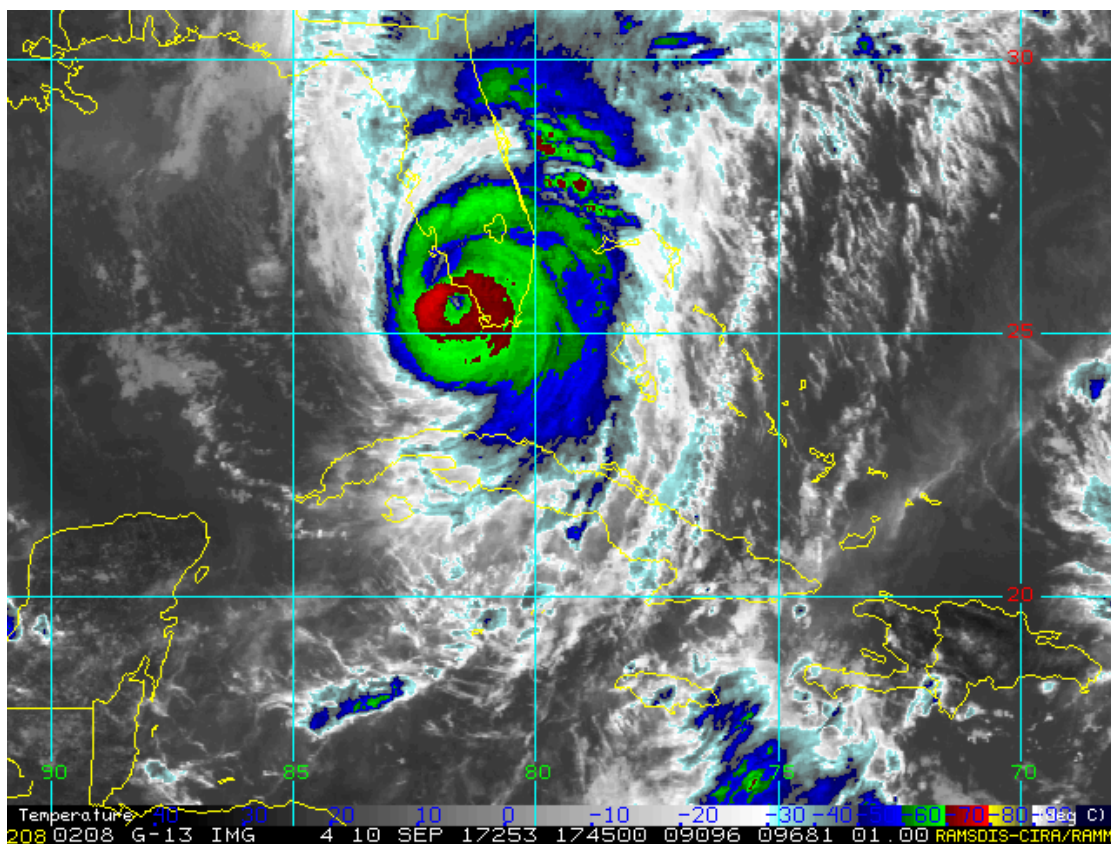


MIAMI-SOUTH FLORIDA

National Weather Service

Forecast Office

<http://www.weather.gov/miami>



Hurricane Irma Makes Landfall in SW Florida on September 10th, 2017

2022 Florida Severe Weather Awareness Week

Thursday, February 10th is Hurricane and Flooding Awareness Day

Following on the heels of a record-breaking 2020 hurricane season, the 2021 Atlantic hurricane season was another active one across the tropical Atlantic.

A total of 21 named storms, including 7 hurricanes and 4 major hurricanes, moved across the Atlantic basin (Figure 1) in 2021. Most importantly, 8 of these storms hit the

U.S. coastline, including three in Florida. Fortunately for South Florida, these weren't among the strongest of the season (Tropical Storm Elsa in July, Tropical Storm Fred in August, and Tropical Storm Mindy in September), with only Elsa and Fred producing limited impacts across our part of the state.

2021 Atlantic Hurricane Season by the numbers

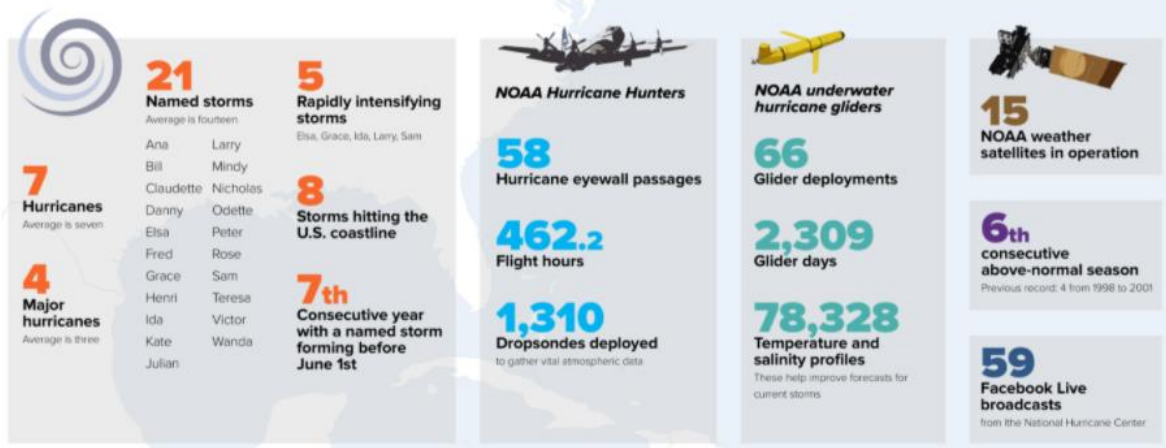


Figure 1: 2021 Atlantic Hurricane Season by the numbers

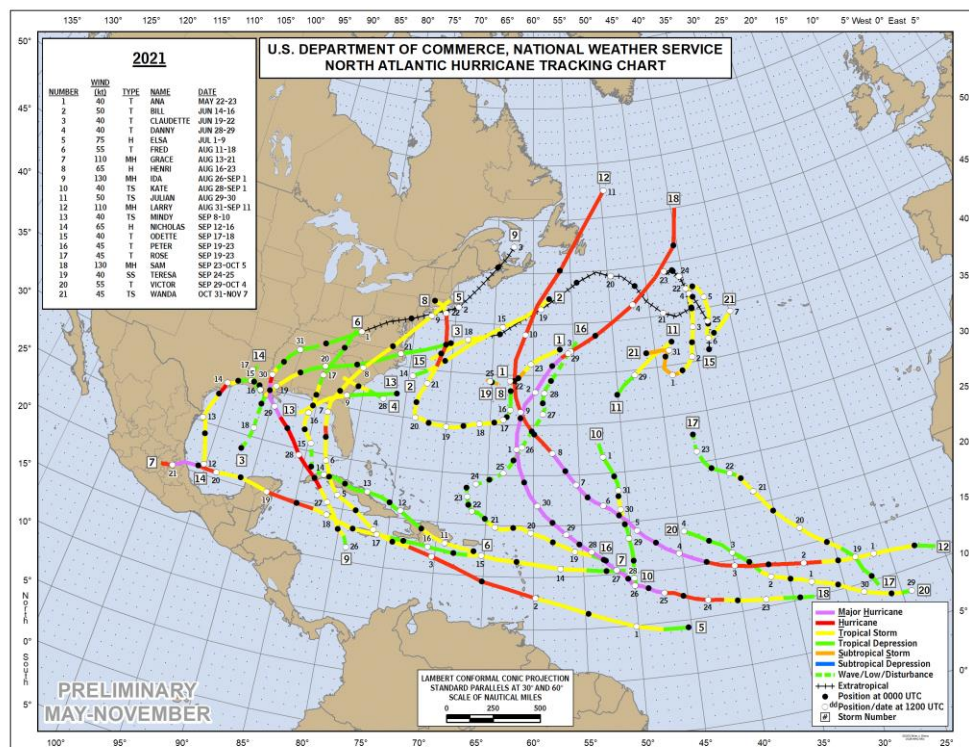


Figure 2: Preliminary Tracks of 2021 Atlantic Tropical Cyclones

IT'S NOT JUST ABOUT THE WIND

As 2021 and recent years have made clear, tropical cyclones are multi-hazard weather systems. While the wind speed is what determines the classification of a tropical cyclone, other hazards such as storm surge, flooding and tornadoes can cause significant impacts including loss of life, regardless of the storm's category. Torrential rainfall from Tropical Storm Eta in November 2020 produced 15-20 inches of rain over parts of SE Florida, causing severe flooding. In 2017, Hurricane Irma's storm tide reached close to 10 feet in the Everglades City/Chokoloskee area of Southwest Florida, and as high as 6 feet as far away as Coconut Grove south of Downtown Miami. Hurricane Irma and Tropical Storm Philippe in 2017 spawned a combined eight tornadoes across South Florida.



Remember: It doesn't take a major hurricane to produce significant impacts. Tropical storms directly impacting South Florida have been known to produce severe flooding, damaging winds and tornadoes. Take every tropical cyclone seriously, whether it's a tropical storm or a major hurricane. Also, pay close attention to the Tropical Weather Outlook issued 4 times a day during hurricane season to stay abreast of weather systems which have the potential of forming into tropical storms, especially those close to Florida such as Tropical Storm Gordon in 2018 and Tropical Storm Sally in 2020.

Important: Historically, it is the water that has caused most of the deaths in hurricanes. About 90 percent of all hurricane-related deaths nationwide occur from drowning from either the storm surge or freshwater flooding. Fortunately, no deaths were directly

attributed to the storm surge from Hurricane Irma, but a slightly different track could have resulted in much higher storm surge and life-threatening flooding.

Residents of coastal and surge-prone areas are urged to heed advice from local officials and evacuate whenever storm surge flooding is expected. Become familiar with your county's storm surge evacuation zones and know whether you live in one or not. **Visit your county's emergency management web site for more information on evacuation zones.**



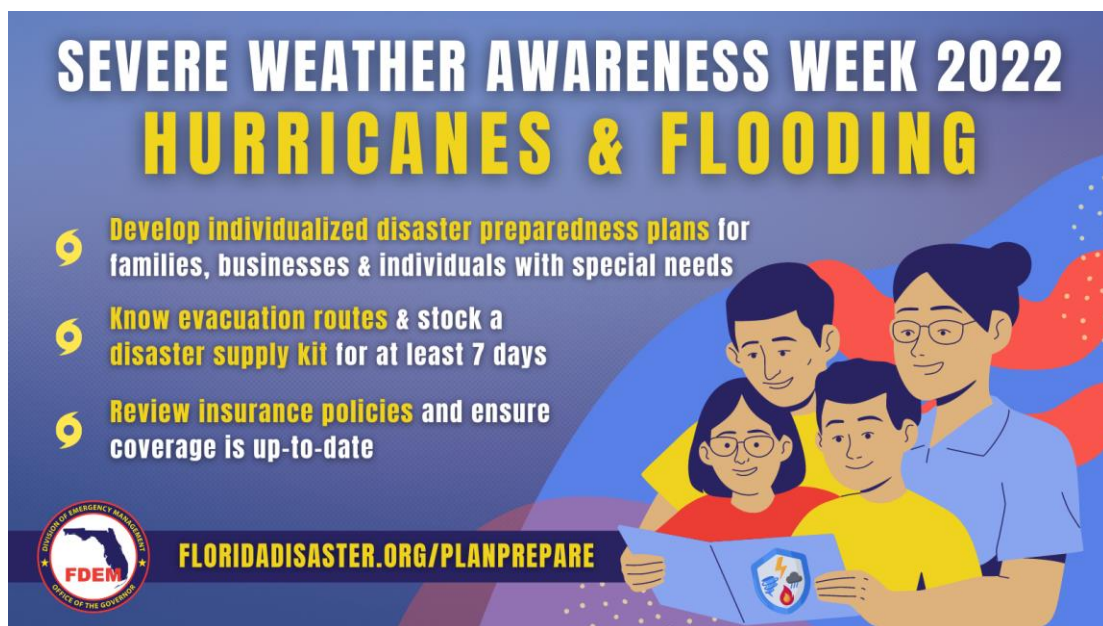
Damage to dock at Tin City in Naples caused by storm surge from Hurricane Irma in 2017 (NWS Storm Survey picture)



Marooned boat in Coconut Grove after Hurricane Irma in 2017 (NWS Storm Survey picture)

The record-active hurricane season of 2020 and the active 2021 season served as a reminder that we live in one of the most vulnerable and hurricane-prone places in the country. On average, the center of a hurricane will pass within 50 miles of any point in South Florida every 6 to 8 years. This means that while hurricane strikes are typically not a yearly occurrence, statistics indicate that South Florida will at least be significantly threatened a few times a decade, and impacted directly by a hurricane at least once a decade. Indirect hurricane impacts, as well as tropical storms passing over South Florida, occur with a much higher frequency; at least every 2 or 3 years on average.

Therefore, we can't afford to become complacent. Be prepared **every year** for the possibility of a tropical storm or hurricane impacting our region.



HURRICANE SAFETY TIPS: Regardless of the short- or long-term hurricane outlook, South Floridians need to be prepared every year. It only takes one big storm to affect our area long-lasting impacts to be felt. Now is the time to begin preparing for the 2022 hurricane season. Develop a plan and have it in place before a storm threatens. Know if you live in a hurricane evacuation zone. Gather supplies such as bottled water, canned foods and batteries. Remember to buy enough provisions to last a minimum of three to five days in the event of a tropical system affecting our area. Buy and install hurricane shutters. Make sure your property insurance is up to date. A minimum of preparation can save lives and property.

People are also urged to be extremely cautious during the storm's aftermath. Typically, more people die after the passage of a storm than during the storm itself. Most of the

deaths associated with Hurricane Irma occurred after the storm's passage from a combination of factors including carbon monoxide poisoning, injuries while removing debris and storm shutters, lack of proper air conditioning, and vehicle accidents. Extreme care must be used when using generators, and make sure to run them in an outdoor location, not inside the house.

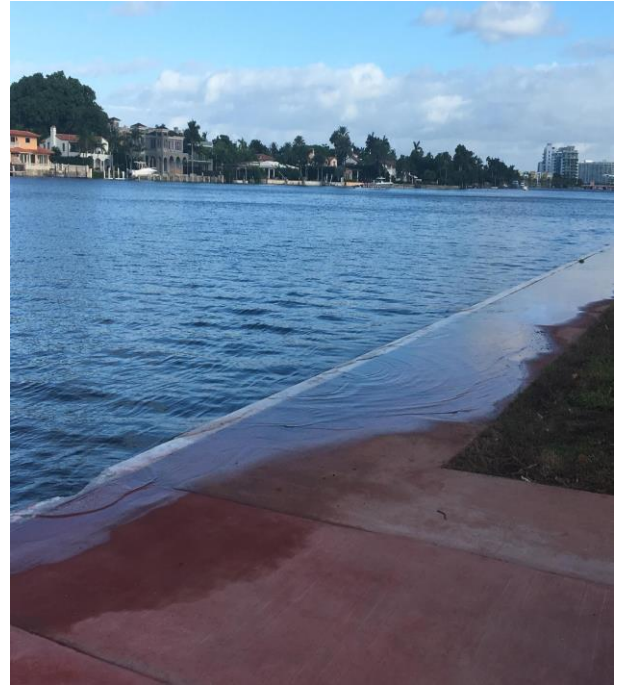
For a comprehensive list of hurricane preparedness information, visit [ready.gov](https://www.ready.gov) and [Ready South Florida](#).

Flooding

South Florida's occasional torrential rains and flat terrain can lead to major flooding. 2021 wasn't a particularly wet year in general, but 2020 was a very wet year, particular from mid-May to mid-November. Over 80 inches of rain fell over large parts of Southeast Florida, with a few locations in Broward County exceeding 100 inches for the year! When you combine this amount of rainfall with our geography, major flooding is the result. Most of the major flooding episodes of 2020 were related to tropical systems. Tropical Storm Eta in November delivered over 10 inches of rain to large swaths of Broward and northern Miami-Dade counties in a 2-day period, with a maximum of 21 inches in Pembroke Pines! Many neighborhoods were isolated for several days due to impassable streets, and water penetrated homes in some areas.

A tropical system doesn't even have to be right over us to get major flooding. Outer bands from distant tropical cyclones can produce localized flooding. While tropical weather systems produce most of the significant and widespread rain events, flooding also occurs from non-tropical weather systems. Stalled frontal systems in the fall, winter, and spring sometimes cause very heavy rainfall leading to flooding, as well as on a typical summer day when local thunderstorms frequently produce enough rainfall to flood streets and cause hazardous driving conditions. Major flooding events occur on average about three times a year across the South Florida region, although highly flood-prone areas such as Downtown Miami, Miami Beach, and other parts of metro SE Florida may experience more events on a yearly basis.

Another type of flooding, tidal flooding due to astronomical high tide (a.k.a. King Tides), typically affects vulnerable areas along the Intracoastal Waterway during high tide cycles in September, October, and November, leading to flooding of streets, parks, and marinas.



Typical South Florida King Tide Flooding (courtesy of Liam Lynam)

PREPARE FOR FLOODING: The flat South Florida terrain lends itself to ponding of water in poorly drained or low-lying areas during heavy rain events, rather than the flash flooding that occurs in other parts of the country. While this type of flooding is normally not as deadly or destructive, it can still lead to significant impacts as water can enter homes and other structures, as well as make driving extremely hazardous due to flooded roadways which can sometimes obscure canals. If water is covering a roadway, do not assume that you can drive through it. **Turn around, don't drown.**

All South Floridians need to be aware of their particular neighborhood's vulnerability to flooding. Fortunately, people can also plan well in advance for floods. The best advice is to have flood insurance, a separate policy from your homeowner's insurance. Know if you live in an area which floods frequently from heavy rains.

Good flood safety information can be found at the [NWS Flood Safety web site](https://www.weather.gov/fld/flood).

Monitor NOAA Weather Radio before, during and after a tropical cyclone or flood event to stay abreast of the latest information. You can also visit the National Weather Service Miami Forecast Office web site at [weather.gov/southflorida](https://www.weather.gov/southflorida) where a description of potential storm impacts and latest hurricane and flood watches and warnings will be available, as well as the National Hurricane Center's five-day tropical cyclone track and intensity forecast.